



April 5, 2021

The Honorable Chair and Members of the  
Hawai'i Public Utilities Commission  
465 South King Street  
Kekuanao'a Building, First Floor  
Honolulu, Hawai'i 96813

Dear Commissioners:

Subject: Docket No. 2021-0024  
Opening a Proceeding to Review Hawaiian Electric's Interconnection Process and  
Transition Plans for Retirement of Fossil Fuel Power Plants  
Kahului Power Plant Transition Plan

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The Hawaiian Electric Companies<sup>1</sup> provide the following information to facilitate further review of their Kahului Power Plant ("KPP") Transition Plan in accordance with Order No. 37624, issued February 11, 2021 in the subject proceeding.

## **I. Introduction and Summary**

Plans to facilitate retirement of KPP have been under way in various forms for at least a decade. KPP is capable of providing approximately 36 megawatts ("MW") of generation.

Ten years ago, the Company requested permission to conduct a procurement process to acquire up to 50 MW of new, renewable firm dispatchable capacity generation resources on the island of Maui, with an initial increment to come on-line in 2015. One year later, the Commission opened a docket for the procurement. One year after that, the Commission indicated that other options besides firm generation should first be considered and closed the docket as premature.

Five years ago, the Company again sought to open a docket to procure generation to, among other things, address the retirement of KPP. The next year, the Company renewed and supplemented its request to seek generation with a target of installation of 2020. Eighteen months after the original request, the Commission opened a comprehensive docket to facilitate issuance of Requests for Proposals ("RFP") for generation on all islands. Ultimately, RFPs to procure generation for Maui were approved and conducted in 2018 (Stage 1 RFPs) and 2019 (Stage 2 RFPs).

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<sup>1</sup> The "Hawaiian Electric Companies" or "Companies" are Hawaiian Electric Company, Inc., Hawai'i Electric Light Company, Inc., and Maui Electric Company, Limited ("Maui Electric" or the "Company").

As a result of the Stage 1 and 2 procurements, the proposed Waena Switchyard project,<sup>2</sup> and other efforts, the Company developed a practical plan for replacing KPP in a way that will over time maintain reliability, lower customer bills and significantly reduce carbon emissions. Necessary resources are scheduled to come on-line before KPP retires. Commission-designated Independent Observers ("IO") have supported the selected resources portfolios. More specifically, the KPP Transition Plan includes 2 MW of load build service, 7 MW of load reduce service, 6 MW of fast frequency response services from customer resources, 175 MW of solar paired with 4-hour battery energy storage, 40 MW of 4-hour standalone battery energy storage, conversion of KPP generating units 3 and 4 ("K3" and "K4") to synchronous condensers, and the construction of the Waena switchyard, proposed to be in-service in December 2022, which is necessary to avoid overloads and maintain stability of the Maui transmission system without KPP. The KPP plan is expected to result in Maui Island reaching a Renewable Portfolio Standards ("RPS") as high as 107% in 2024 (90% renewable energy). The net impact of the Stage 2 and Waena Switchyard projects is estimated to lower a typical customer bill by \$3.78 per month on average over the next 20 years.

Updated analyses also confirm that the resource portfolio selected by the Company will meet the Company's energy reserve margin ("ERM") guideline, improve grid resilience, reduce renewable energy curtailment and fossil fuel consumption, and increase renewable energy utilization. Nevertheless, the Company will pursue additional grid services to add capacity beyond the energy reserve margin to mitigate pre-2023 adequacy of supply risks, serve as a contingency to unforeseen delays or withdrawal of Stage 1 and 2 projects, and assist in mitigating unforeseen extreme events that threaten system reliability.

## **II. Background**

### **A. Overview of Maui System**

In general, Maui Electric serves its customers with power generated from (1) Maui Electric's Ma'alaea Power Plant ("MPP") in Ma'alaea along North Kihei Road, KPP, adjacent to the Kahului Harbor, and Hana Power Plant ("HPP"), (2) independent power producers ("IPPs"), and (3) distributed generation ("DG"). The power is delivered through the 69 kV transmission line system ("69 kV System") and the 23 kV transmission line system ("23 kV System") to the distribution system and Maui Electric's residential, commercial and industrial customers. The 69 kV System transmits power generated by the MPP and various IPPs to most of the island and also under most conditions provides power to the 23 kV System through several tie-transformers. The KPP generating units supply power to the 23 kV System which serve the area from Waiehu

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<sup>2</sup> See Docket No. 2020-0167, *In the Matter of the Application of Maui Electric Company, Limited, For Approval to Commit Funds in Excess of \$2,500,000 (Excluding Customer Contributions) for the Switchyard/Synchronous Condenser Project and to Recover Costs through the Major Project Interim Recovery Adjustment Mechanism.*



to Makawao and Hana. However, most of the load on the 23 kV System is located in the area of Kahului, Wailuku, and Waiehu.

## **B. The KPP Transition Plan**

The KPP Transition Plan has several key components: (1) the Stage 1 and Stage 2 RFP projects will provide capacity and energy replacement and grid services; (2) the K3 and K4 generating units of KPP will be converted and repurposed to synchronous condensers to replace critical voltage support service and synchronous inertial response provided by KPP, among other essential grid services; (3) the Waena Switchyard project will maintain functionality and reliability of the transmission system serving Maui in the absence of KPP, avoid circuit overloads, and reliably integrate new renewable resources; and (4) contingency plans that include DER grid service programs and a review of generator maintenance schedules as needed.

## **C. Regulatory proceedings background**

The Company has been planning for the retirement of the KPP for over ten years. On January 31, 2011, the Company sent a letter to the Commission to request that a docket be opened “for the purpose of receiving filings, reviewing approval requests, and resolving disputes, if necessary, related to MECO’s plan to proceed with a competitive bidding process to acquire up to approximately 50 MW of new, renewable firm dispatchable capacity generation resources on the island of Maui...” On February 24, 2011, the Commission issued an order to open Docket 2011-0038, pursuant to the Framework for Competitive Bidding dated December 8, 2006. The Commission subsequently issued Order No. 31357 closing this docket on July 11, 2013, stating that the RFP and proceeding governing such RFP process appear to be premature and the Commission will consider future requests to open another proceeding to conduct an RFP for generation upon a demonstration of need and a plan focused on customer needs.

On May 5, 2016, the Company sent a letter to the Commission to request that a docket be opened “for the purposes of receiving filings, reviewing approval requests, and resolving disputes, if necessary, related to the Company’s plan to acquire approximately forty (40) MW of Dispatchable Firm Generation on the island of Maui through a firm generation request for proposal (“Maui Electric Dispatchable Firm Generation RFP”) [footnote omitted].” Maui Electric noted that the firm generation capacity was needed to address key issues identified in the Power Supply Improvement Plan (“PSIP”) Update, as well as those discussed in Maui Electric’s 2016 Adequacy of Supply Report (“AOS”) filed January 29, 2016. These issues included: (1) the planned retirement of KPP; (2) providing a non-transmission alternative (“NTA”) to mitigate an under-voltage situation in South Maui; (3) anticipated system load growth and reserve capacity shortfall expected in 2017 through 2022; and (4) Hawaiian Commercial & Sugar ceasing operations in 2017. The Commission did not open a docket in response to this request.

On January 6, 2017, the Companies sent a second letter to the Commission to request “that the Commission open a docket and appoint an Independent Observer (“IO”) to allow the Company to seek proposals for new renewable energy generation (with a target of installation of 2020)...This new renewable energy generation is requested in addition to the firm dispatchable generation requested in the Company’s letter to the Commission dated May 5, 2016.”

On October 6, 2017, by Order No. 34865, the Commission opened Docket 2017-0352 which, among other things, directed that “The HECO Companies shall file in this docket their draft RFPs and supporting documentation, along with a detailed description of how the Companies propose to successfully execute the competitive bidding process, withing fifteen (15) days of the date of this order.” On October 23, 2017, the Companies filed, among other things, the requested draft RFPs and supporting documentation.

On January 12, 2018, the Commission issued Order No. 35224 which, among other things, directed the Companies to prioritize finalizing the O‘ahu, Maui, and Hawai‘i Island variable RFPs. The Commission noted that the Companies should be prepared to initiate the Maui Firm RFP subsequent to receiving further guidance from the commission and the IO, which was expected to occur in the first quarter of 2018.

The Companies filed the proposed final Variable Renewable Dispatchable Generation (“RDG”) RFPs for O‘ahu, Maui and Hawai‘i on February 2, 2018, which were approved by the Commission in Order 35286 issued on February 20, 2018.

On February 27, 2018, the Companies issued the Stage 1 RFPs for Variable Renewable Dispatchable Generation for the islands of O‘ahu, Maui, and Hawai‘i. A separate procurement was conducted on each island, which resulted in a Final Award Group being selected for the Maui Stage 1 RFP on September 14, 2018. Executed Power purchase agreements for the two selected projects on Maui were filed with the Commission on December 31, 2018.

On February 7, 2019, the Commission held a Status Conference during which the Companies were instructed to “present their proposed plans for Phase 2 of the competitive procurement process, as well as an estimate of the Companies’ expected timeline to file their Phase 2 Proposed RFPs for commission review.” The Companies presented an update on the Maui system needs, highlighting 1) the shortfall of 65,000 annual MWh that was not acquired in Stage 1 in order to meet the 2022 PSIP target; 2) the approaching retirement of the KPP by the end of 2024, and 3) the additions of biomass units and internal combustion engines in 2022 to support the MWh and MW needs of the Maui system. The Companies explained that standalone storage, renewable + storage that could be grid charged, and renewables + storage could meet that need. The Companies further explained the various procurement approaches that had been considered: 1) procurement similar to Stage 1 for variable projects with and without storage and grid charging; 2) procurement of stand-alone grid charged storage; 3) a combined single procurement for variable generation and stand-alone energy storage; 4) all-resource procurement;



and 5) a firm resource procurement. The Companies proposed a combined procurement for variable generation and stand-alone storage for Maui.

On February 27, 2019 the Commission issued Order 36187 which directed the Companies to conduct “Parallel and (1) Combined RFPs + (2) Expedited Grid Services RFPs” and stated that “[t]hese parallel procurement processes would allow the Companies to set targets for grid services’ contributions to overall grid needs separately, rather than within an all-resource procurement, reducing any concerns about the potential complexity of wrapping aggregated demand-side resources into an all-resource procurement.”<sup>3</sup>

On August 22, 2019 the Companies issued the Stage 2 Request for Proposals for Variable Renewable Dispatchable Generation for the islands of O‘ahu, Maui, and Hawai‘i. Order No. 36187 stated, “[t]he commission anticipates that the central focus of the upcoming Phase 2 procurement process will be to replace the capacity, energy, and ancillary services from the AES Hawaii Power Plant (“AES Plant”) on Oahu and MECO’s Kahului Power Plant (“Kahului Plant”), as the commission expects the Companies to hold firm on the timelines set forth in the PSIPs for retiring those facilities.”<sup>4</sup> As with Stage 1, a separate procurement was conducted on each island. However, in contrast, the Commission-approved Stage 2 RFP explicitly allowed standalone storage projects to be bid, evaluated, and procured in the Stage 2 RFP, which RFP was intended to replace capacity, energy, and ancillary services provided by KPP. As outlined in the RFP, a robust three phase bid evaluation process, approved by the Commission and overseen by the Commission’s IO, was used to evaluate the projects submitted for consideration in response to the Stage 2 RFP; through this process, four projects were selected to the Final Award Group for the Maui Stage 2 RFP on May 8, 2020. With concurrence from the IO, the Companies selected the portfolio that the IO later affirmed in his final report “was most optimal from a risk, cost and benefit perspective”<sup>5</sup> as its Maui Final Award Group. This Final Award Group included the Waena BESS, a Company self-build proposal to provide 40 MW and 160 MWh of grid-tied standalone storage, as providing a necessary amount of energy storage capability at the best value to customers. The application requesting approval of the Waena BESS Project was filed on September 8, 2020, Docket No. 2020-0132.

### III. DISCUSSION

#### **A. Sufficient resources have been procured to replace KPP; those resources are scheduled to come on-line before KPP is retired at the end of 2024**

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<sup>3</sup> Order No. 36187 at 12.

<sup>4</sup> Order No. 36187 at 2.

<sup>5</sup> *Maui Electric Company Request for Proposals for Variable Renewable Dispatchable Generation: Closing Report of Guidehouse, Inc. as Independent Observer*, dated October 9, 2020, filed October 21, 2020 in Docket No. 2017-0352 (“Maui Stage 2 IO Report”) at 20.

All of the Stage 1 and Stage 2 RFP projects are scheduled to be in commercial operation with sufficient buffer to enable the retirement of KPP by the end of 2024. These projects include Paeahu Solar and AES Kuihelani Solar from Stage 1, and Kahana Solar, Pulehu Solar, Kamaole Solar, and the Waena BESS from Stage 2. Figure 1 illustrates the current timing of various components of the KPP Transition Plan.

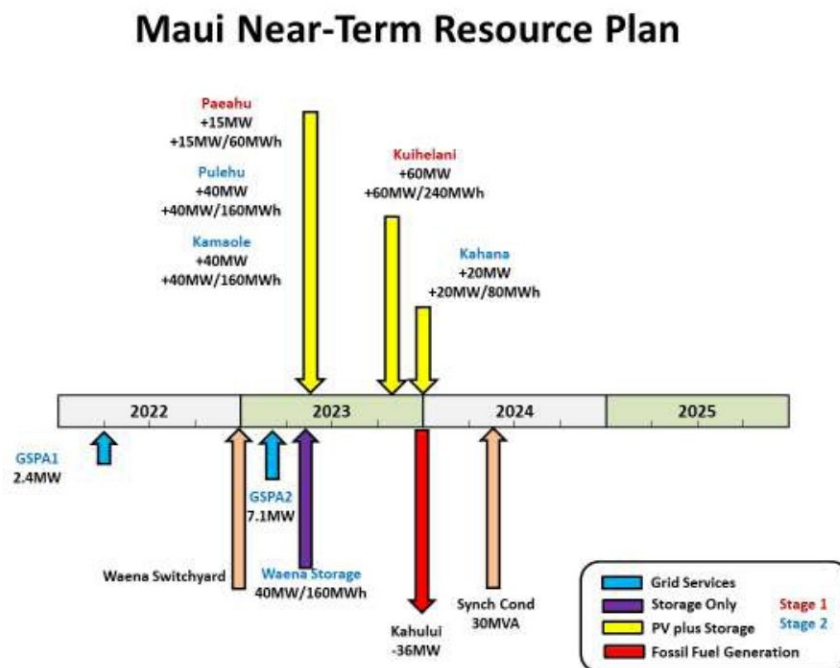


Figure 1 – KPP Transition Plan Schedule

The Maui Stage 2 IO Report supported the selection of the final award group as being optimal from a risk, cost and benefit perspective for reasons which included: higher overall renewable energy utilization both for the portfolio and the overall system; less fossil fuel usage and fewer emissions; higher Net Energy Potential of renewable energy; increased resiliency due to the additional storage; geographic diversity and resiliency due to the additional storage capacity at Waena outside of a tsunami or flood zone that could provide essential capacity in the event of the last remaining firm generating station; and that the successful execution of the final award group by April 2023 would meet the KPP retirement date.<sup>6</sup>

<sup>6</sup> See Maui Stage 2 IO Report at 19.



**1. The Company's analysis indicates that current Guaranteed Commercial Operations Dates of the Stage 1 and Stage 2 projects meet energy reserve margin guidelines in 2023-2025**

The Company conducted an ERM analysis for the years 2023-2025 using updated Stage 1 and Stage 2 guaranteed commercial operations dates ("GCOD"). If all projects reach commercial operations in accordance with their current contracted GCOD, every hour between 2023 and 2025 is expected to have sufficient resources (*i.e.*, conventional generation, Stage 1 and 2 projects, grid services, etc.) to meet demand, in addition to at least 30% ERM.<sup>7</sup>

**2. The Portfolio of resources in front of the commission is robust**

Upon further testing of the Maui Island system's ability to satisfy the 30% ERM guidelines, the Company finds that the resource portfolio remains robust. From an ERM perspective, the portfolio is capable of withstanding delays or withdrawal of projects while still meeting the ERM guideline for Maui Island by the scheduled retirement of KPP. The chart in Figure 2 summarizes the various scenarios tested for ERM,<sup>8</sup> where the numerical values indicate the number of hours that the ERM is below the 30% guideline in any given month.

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<sup>7</sup> The ERM estimates reserves needed for contingencies (*i.e.*, the loss of largest unit) and emergencies, such as multiple forced outages and unplanned maintenance, among others. The reserve margin reduces risk exposure to unserved energy occurrences during times when margins may be tight due to customer load demand, generator maintenance, weather, unforced generator outages, among others; however insufficient ERM does not necessarily mean the Company will be unable to meet customer demand (unserved energy).

<sup>8</sup> Assumptions include, CBRE Stage 1: 1 MW PV+BESS from 7/1/2021; CBRE Stage 2: 15 MW PV+BESS from 1/1/2025; RFP Stage 1: Kuihelani 60 MW PV+BESS from 10/27/2023, Paeanu 15 MW PV+BESS from 4/28/2023; RFP Stage 2: Waena 40 MW BESS from 4/28/2023 (Grid Chargeable), Pulehu 40 MW PV+BESS from 4/30/2023 (Grid Chargeable), Kahana 20 MW PV+BESS from 12/29/2023, Kamaole 40 MW PV+BESS from 4/30/2023, Kahului Retirement: Kahului 1 retires 11/30/2024, Kahului 2 retires 11/30/2024, Kahului 3 offline 1/1/2024, Kahului 4 offline 4/1/2024; Grid Services Forecasted Ramp-up to 7.2 MW by 2024; Maui Fast DR Program; 2020 IGP COVID Update Sales & Peak Forecast; High Load sensitivity uses June 2019 Sales & Peak Forecast.

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Figure 2 – ERM Sensitivity Analyses for Different Combinations of Projects

Figure 3 provides the estimated ERM per month between 2022-2025 for select cases from Figure 2. Figure 3 illustrates the estimated ERM for the following cases:



- No Stage 1 or 2 projects come online, grid services ramp-up as forecasted, and KPP retires as scheduled;
- All Stage 1 projects come online as currently scheduled, grid services ramp-up as forecasted, and KPP retires as scheduled;
- Stage 1 projects plus Waena BESS come online as currently scheduled, grid services ramp-up as forecasted, and KPP retires as scheduled; and,
- All Stage 1 and Stage 2 projects come online as currently scheduled, grid services ramp-up as forecasted, and KPP retires as scheduled.

For context, Figure 3 also notes resource additions and subtractions. It is important to keep in mind ERM is not only influenced by resource additions and subtractions but also load and generating unit availability.

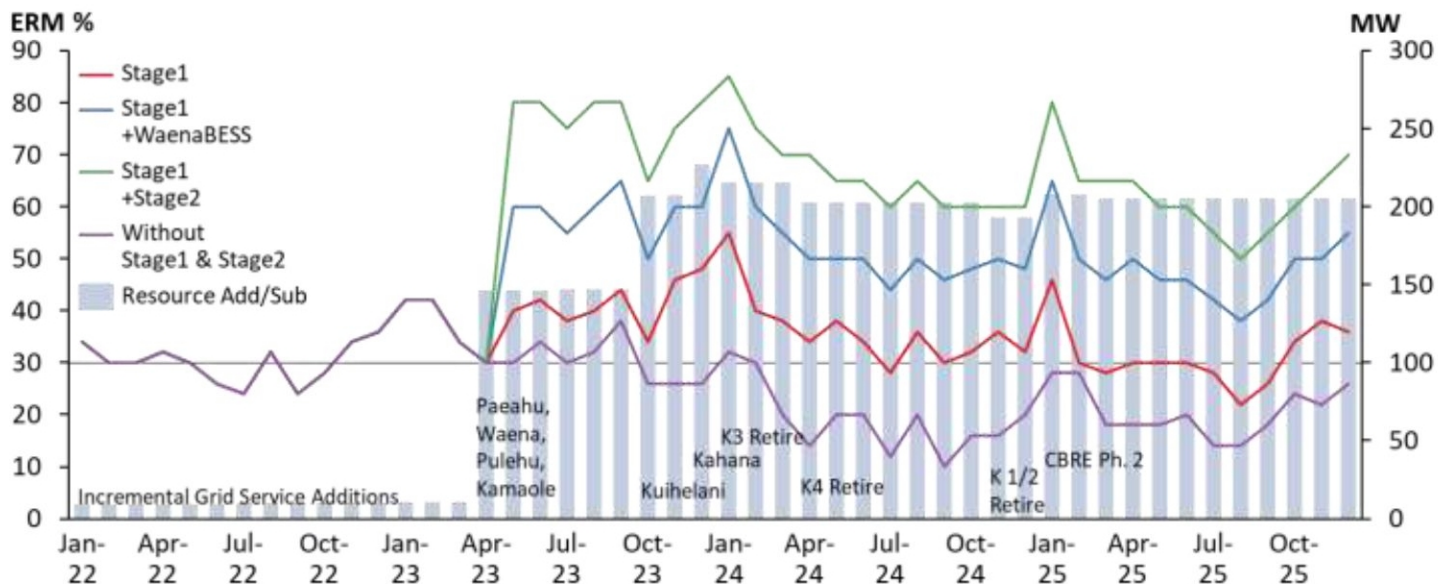


Figure 3 –Monthly ERM from 2022-2025 for various scenarios

As the analysis in Figure 3 indicates, the portfolio is able to withstand delays or withdrawal of certain projects.

The IO believes the selected Stage 2 portfolio is reasonable in part due to its robustness, stating that the selected Stage 2 portfolio “[d]eveloper diversity is higher and the overall execution risk lower. The final award portfolio involves four separate entities, potentially reducing execution risk”.<sup>9</sup> The IO went on to say, “[a]dditional grid flexibility and reliability is

<sup>9</sup> Maui Stage 2 IO Report at 19.

inherent in this portfolio. The inclusion of the standalone BESS increases redundancy by meeting the original target with the benefit of having added equivalent redundancy coming from the paired solar plus storage projects as well.”<sup>10</sup>

**B. The Waena Switchyard Project and conversion of K3 And K4 to Synchronous Condensers will provide voltage support and needed system stability**

KPP Generators currently support serving the peak loads and system voltage on the 23kV System which serves central Maui. This support will be replaced by the proposed Waena Switchyard project and conversion of K3 and K4 generating units to synchronous condensers. The project involves the (1) construction of a switchyard on the Maui Electric owned Waena site, termination of two 69kV transmission lines at the Waena site, and relocation of a short section of transmission line at the Waena site, and (2) the conversion of KPP generating units K3 and K4 to synchronous condensers. The switchyard construction and the conversion of K3 and K4 to synchronous condensers will occur in three phases: (1) the Waena Switchyard, (2) the K3 Synchronous Condenser Conversion and (3) the K4 Synchronous Condenser Conversion.

Without operation of the KPP generating units, voltage on the 23kV System would drop to unacceptable levels under normal and emergency conditions (*e.g.* the loss of a transmission line). The power provided from the 69 kV system to the 23 kV system would need to increase and overloads on 69-23 kV tie transformers and transmission lines would occur during certain contingencies and events. In other words, for the Company to remove the reliability constraints requiring operation of KPP generating units, the Company must replace the voltage support service provided by KPP and relieve transmission loading on the 23kV System. Otherwise, Central Maui faces transformer overloads and voltage instability on the 23kV System for various faults and contingencies, which has high potential for unacceptable customer impacts such as load shedding, voltage collapse, and possible island wide blackouts. The least cost solution that enables the safe retirement of KPP was determined to be the Waena Switchyard and conversion of K3 and K4 generating units to synchronous condensers. Together, these projects would (1) maintain functionality and reliability of the Maui system without the generating units at KPP supplying power, (2) provide voltage support, and (3) avoid circuit overloads.

The addition of the Waena Switchyard alone, with or without the Waena BESS, will relieve transmission congestion following the retirement of KPP by creating more transmission paths by intersecting existing transmission lines with the new switchyard. No new transmission lines will be needed in the construction of the Waena Switchyard.

The synchronous condensers, in addition to providing critical voltage support on the 23kV System, will also provide other essential reliability services such as inertia and short circuit current. Both are needed to maintain system protection schemes that protect utility equipment

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<sup>10</sup> Id.



and mitigate risk to public safety. The synchronous condensers also provide mechanical inertia that is needed to allow for sufficient time for other frequency services to activate and respond to system disturbances. For example, without certain levels of inertia to slow down the rate of change of frequency, the fast frequency and primary frequency services being provided by the portfolio of resources would be rendered useless, as the system could collapse before those services have a chance to respond to the disturbance. The need for the inertial and dynamic frequency response provided by synchronous condensers is essential to grid operation in the future transformation, with minimal fossil resources and reliance upon solar, wind and storage.

### **C. Grid Services and maintenance schedule adjustments can provide contingencies**

#### **1. Existing grid services**

Grid service procurements have also been an important part of addressing adequacy of supply needs. In 2015 the Company issued an initial round of RFPs that included a call for load reduce grid services that would contribute toward addressing the adequacy of supply issue. That procurement resulted in an executed grid services purchase agreement for 2.4 MW of load reduce. Subsequently in 2019, the Company issued a Phase 2 grid services RFP seeking up to 21 MW of load reduction services. The result of that RFP was execution of Grid Service Purchase Agreements ("GSPA") totaling 7.1 MW of load reduction services, short of the target.

#### **2. The Company will pursue additional grid services**

Beyond programs and procurements already in place today, the Company proposes to pursue additional grid services up to 30 MW with at least a 2 hour duration to add additional capacity beyond the ERM that would help mitigate pre-2023 adequacy of supply risks, serve as a contingency to unforeseen delays or withdrawal of Stage 1 and 2 projects, and assist in mitigating unforeseen extreme events that threaten system reliability. The Company will take a different approach to securing grid services in a way that not only acts as a contingency measure, but also as a potential resource that could fulfill other system needs in the future. Rather than undergo another competitive procurement through its GSPA, the Company will work with parties in the Distributed Energy Resources Policy docket to develop a programmatic approach for grid services, with a focus on load reduce services. While programmatic approaches have less stringent performance requirements than a GSPA, and often result in less MW than expected

when called upon,<sup>11</sup> a program approach could potentially yield more services (in MW) than previous competitive procurements.

The Company's evaluation indicates ERM shortfalls between 2022 to 2025, *assuming that no Stage 1 and 2 projects come into service and KPP retires as scheduled*. As various Stage 1 and 2 projects come online the ERM shortfalls will decline (see, Figure 2), significantly reducing the value and utilization of any potential grid service resource. However, to best understand the need for any potential grid service programs, the worst-case, no future Stage 1 and 2 projects scenario, was used. The following figures quantify the time of day, frequency, and duration of occurrences of ERM shortfalls.

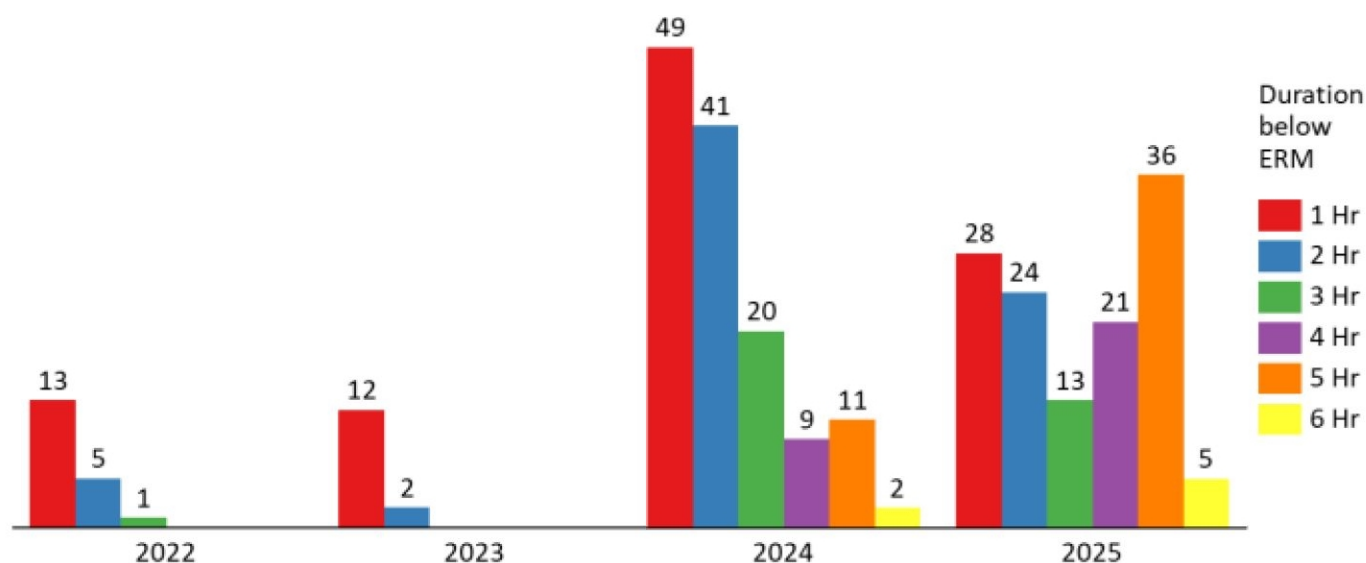


Figure 4 – Number of Events Below ERM Target by Duration of Event in the Worst-Case, No Stage 1 and 2 Projects Scenario

<sup>11</sup> *Final Root Cause Analysis Mid-August 2020 Extreme Heat Wave*, January 13, 2021 at 6, which stated, “Demand response – While a significant portion of emergency demand response programs (reliability demand response resources or RDRR) provided load reductions when emergencies were called, the total amount did not approach the amount of demand response credited against RA requirements and shown as RA to the CAISO. Some, but not all of this difference, is the result of the credited amounts including a “gross up” that the CPUC applies to demand response resources consisting of approximately 10% for avoiding transmission and distribution losses, and 15% for avoided planning reserve margin procurement for customers who agree to drop load in grid emergencies. Additional analysis and stakeholder engagement are needed to understand the discrepancy between credited and shown RA amounts, the amount of resources bid into the day-ahead and real-time markets, and performance of dispatched demand response.”



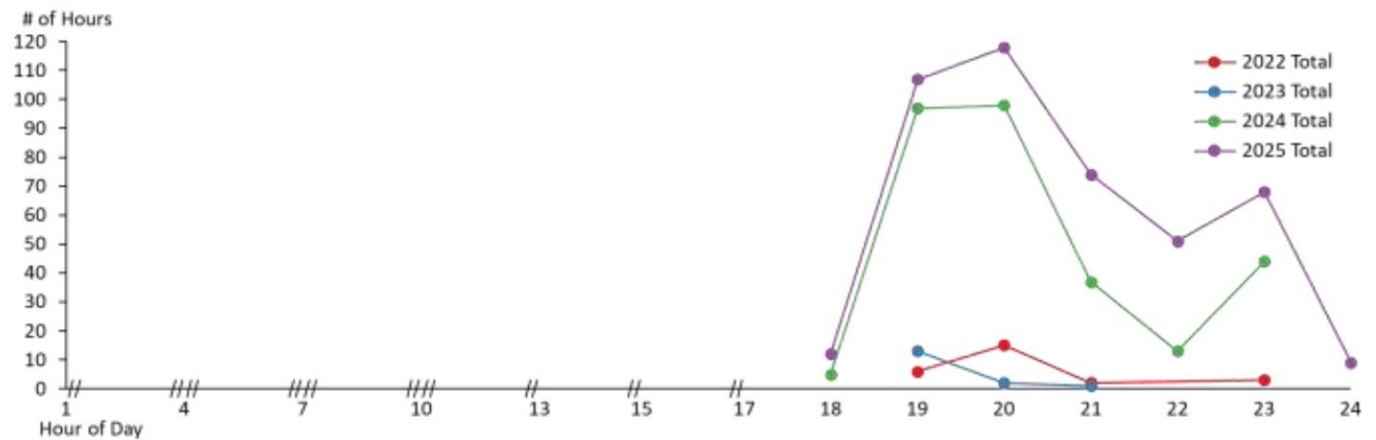


Figure 5 – Number of Hours Below ERM Target 2022-2025 by Hour of Day in the Worst-Case, No Stage 1 and 2 Projects Scenario

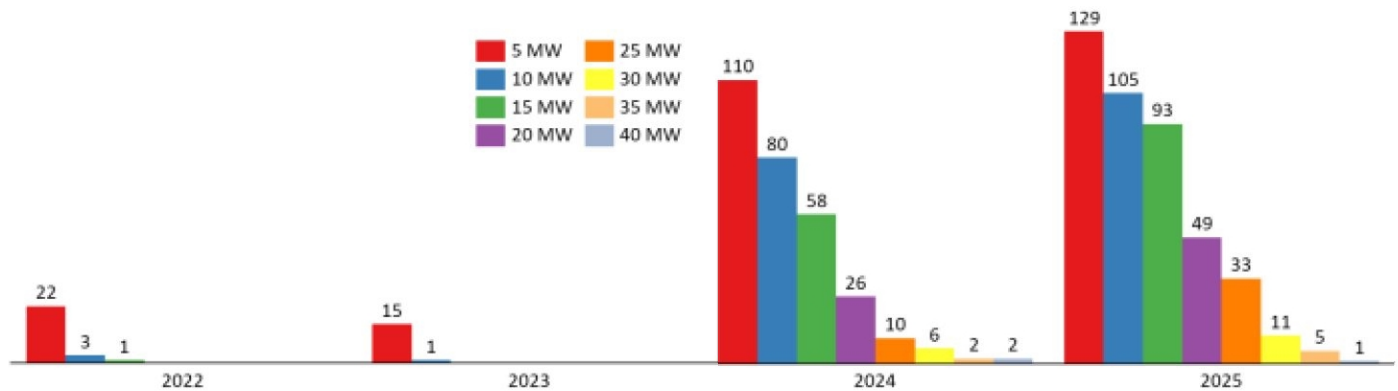


Figure 6 – Number of Hours Below ERM by MWs Short of Meeting ERM Target in the Worst-Case, No Stage 1 and 2 Projects Scenario

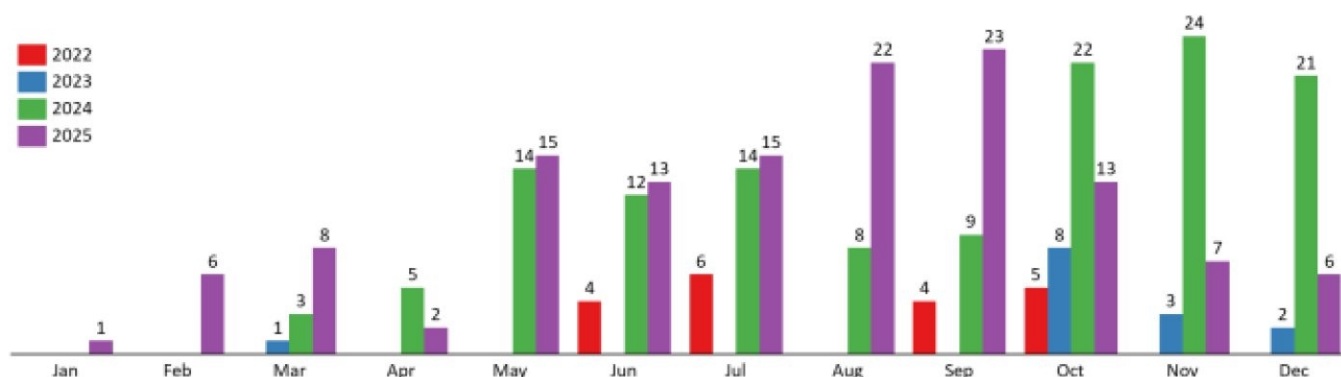


Figure 7 – Monthly Events (# of days) Below the ERM Target, 2022-2025, in the Worst-Case, No Stage 1 and 2 Projects Scenario

Assuming that some portion or all of the Stage 1 and Stage 2 projects reach commercial operations, ERM will largely be satisfied in 2024 and 2025. In years 2022 and 2023, prior to the first project's expected commercial operation, there are a limited number of occurrences when the system may have insufficient reserves above what is needed to serve the expected demand. A grid services program could be useful in providing reserves in the near-term should such a situation present itself. As Stage 1 and 2 projects enter commercial operation, any contemplated additional incentive beyond baseline grid service valuations could taper as the system's energy reserves increases. Further discussions are needed on program design.

### 3. Maintenance schedules can be adjusted

In the immediate term, the risk of not satisfying ERM could be greater in 2021 than in future years prior to the retirement of KPP. This is primarily a function of the planned maintenance schedule, which has flexibility to be adjusted if necessary. The maintenance schedule in August and September of 2021 includes planned outages of the combined-cycle trains at the Ma'alaea Power Plant. If system load demand remains suppressed due to COVID-19 effects, this should allow these outages to occur as scheduled without risk of being short on generation capacity. However, if system load demand rebounds to levels assumed in the planning analysis, some of the work will be deferred as a measure to limit the amount of capacity taken out of service. This opportunity is available and reasonable since all four of the in-service combustion turbines and the one spare turbine recently completed their major 50,000-hour overhauls and are in excellent operating condition. The planned maintenance schedule for 2022 was created with the assumption that system load demand will be closer to pre-pandemic levels and there are limited options to remedy potential capacity limitations.



**D. The KPP Transition Plan will lower customer costs and reduce curtailment**

**1. The KPP Transition Plan will lower customer bills**

Together, over time, the Stage 1 and Stage 2 projects are expected to lower a typical Maui Electric customer bill by \$1.45 per month on average over the next 20 years. In addition, the Waena switchyard and synchronous condenser projects are estimated to lower a typical Maui Electric customer bill by an average of \$2.33 per month. The net effect of these efforts is estimated to lower a typical customer bill by \$3.78 on average per month over the next 20 years.

**2. The selected Waena BESS project provides unique contributions within the resource portfolio**

The Waena BESS, selected as part of the Stage 2 portfolio, will provide essential grid services and reduce curtailment.

Energy storage technologies are increasing the flexibility to utilize renewable technologies in electric grids and revolutionizing the way customers manage their energy costs. As the Companies increase the amount of variable energy production on their systems, energy storage plays a growing role in distributing that energy throughout the day to coincide with demand, and to provide grid services such as primary frequency response, regulating reserves, and load-shifting. In addition to its capacity role, and as required by the Stage 2 RFP, the Waena BESS will have the capability to serve as an energy-shifting resource, as well as providing grid-forming and blackstart capabilities, two capabilities that are not available through the Stage 1 projects but are necessary for grid stability and recovery from system disturbances. Without the grid-forming capability the system would be unstable and unable to withstand faults and contingencies. Grid forming is essential for the transition to reliance upon solar, storage, and wind as the primary energy sources.

The Waena BESS is expected to be charged from renewables on a daily basis from an estimated 87% renewable energy, which is consistent with the island of Maui achieving 90% renewable energy in the near-term. The proportion of renewable energy that charges the Waena BESS will increase over time as Maui's RPS increases.

The Waena BESS is also expected to increase ability to accept energy from existing renewables on Maui by a substantial amount, as, unlike fossil resources, it does not have a minimum dispatch limit.

The Maui Stage 2 IO Report affirmed the reasonableness of the selected portfolio, including Waena BESS, stating that "[t]his portfolio's storage capacity enables higher overall renewable energy utilization both when looking at the utilization of the portfolio and overall

system utilization.”<sup>12</sup> In effect, the Waena BESS will help to increase Maui’s RPS when compared to a portfolio without the Waena BESS. Further, the report stated that “[a]dditional grid flexibility and reliability is inherent in this portfolio” and that the “inclusion of the standalone BESS increases redundancy by meeting the original target with the benefit of having added equivalent storage redundancy coming from the paired solar plus storage projects as well.”<sup>13</sup>

#### IV. CONCLUSION

The Companies believe the KPP Transition Plan is robust and resilient and will over time maintain reliability, lower customer bills and significantly reduce carbon emissions.

Sincerely,

/s/ Colton K. Ching

Colton K. Ching  
Senior Vice President  
Planning & Technology

c: Division of Consumer Advocacy

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<sup>12</sup> Maui Stage 2 IO Report at 19.

<sup>13</sup> Id.



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